Student Name

Mathematics Stage 5 Core

ALGEBRAIC TECHNIQUES A

Book 2 Apply the distributive law to the expansion of algebraic expressions and collect like terms where appropriate

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CONTENTS

Overview 2
Expanding Brackets Involving Negative Coefficients 4
Expanding then Simplifying 8
Expanding Binomial Products 16
Expanding Binomial Products using the Rule 19
Check Your Understanding 22

OVERVIEW

SYLLABUS CONTENT

MA5-ALG-C-01 simplifies algebraic fractions with numerical denominators and expands algebraic expressions

Apply the distributive law to the expansion of algebraic expressions, and collect like terms where appropriate

- Expand algebraic expressions, including those with negative coefficients
- Expand and simplify algebraic expressions by removing grouping symbols and collecting like terms where appropriate
- Expand binomial products algebraically using the distributive law or consider areas of rectangles as a possible method of expansion

REVIEW OF PRIOR KNOWLEDGE

1 Expand the following.

a	$7(l+4)$	**b**	$4(2x-6)$	**c**	$5(3e+8)$
d	$9(x-9)$	**e**	$10(6g-7)$	**f**	$7(8x-2)$
g	$6i(t-v)$	**h**	$7y(4y+7g)$	**i**	$14k(k-3)$

2 Simplify these expressions.

a	$7a+8+12a$	**b**	$12x-8+9x-13$	**c**	$-5xy+55-7yx-3$
d	$7a^2+3a-12a$	**e**	$9y-8x+12xy+9x$	**f**	$12xy^2-8y^2a+13$

EXPANDING BRACKETS INVOLVING NEGATIVE COEFFICIENTS

Distributive Law

To expand brackets, we use the distributive law:

$$a(b + c) = ab + ac$$

Example Expand algebraic expressions using the distributive law.

$-8(7 + 2y)$

$= -56 - 16y$

	7	$2y$
-8	-56	$-16y$

$-x(2y - z)$

$= -2xy + xz$

	$2y$	$-z$
$-x$	$-2xy$	xz

Expand these expressions.

a $-3(m + 3)$

	m	3
-3		

$-3m - 9$

b $-(y + 4)$

	y	4
-1		

$-y - 4$

c $-5(2m + 7)$

	$2m$	7
-5		

$-10m - 35$

d $-x(8 - 3m)$

$-8x + 3xm$

e $-y(y - 9)$

$-y^2 + 9y$

f $-4t(t - 8)$

$-4t^2 + 32t$

Key ideas

1. The distributive law says to expand brackets by …… the term on the outside by the terms on this inside of the brackets.
2. In the expression $-x(a + b)$, we multiply each term inside the brackets by ……

1 Expand these expressions.

a $3(x+4)$

$3x+12$

b $3(4+x)$

$12+3x$

c $3(4-x)$

$12-3x$

d $3(x-4)$

$3x-12$

e $3(-x-4)$

$-3x-12$

f $-3(x+4)$

$-3x-12$

g $-3(x-4)$

$-3x+12$

h $-3(2x-4)$

$-6x+12$

i $-3(4-2x)$

$-12x+6x$

j $3(x+4)$

$3x+12$

k $-6(2-x)$

$-12+6x$

l $6(x-2)$

$6x-12$

m $6(x-2y)$

$6x-12y$

n $6(5x-2y)$

$30x-12y$

o $-6(2y-5x)$

$-12y+30x$

p $-6(2y-5x-7z)$

$-12y+30x+42z$

q $-6(5x-2y-7z)$

$-30x+12y+42z$

r $-6(-5x-2y-7z)$

$30x+12y+42z$

s $-(-5x-2y-7z)$

$5x+2y+72$

t $-6(2-x)$

$-12+6x$

2 Expand these expressions.

a $x(x+4)$

x^2+4x

b $x(4+x)$

$4x+x^2$

c $x(4-x)$

$4x-x^2$

d $x(x-4)$

x^2-4x

e $x(-x-4)$

$-x^2-4x$

f $-x(x+4)$

$-x^2-4x$

g $-x(x-4)$

$-x^2+4x$

h $-x(2x-4)$

$-2x^2+4x$

i $-x(4-2x)$

$-4x+2x^2$

j $x(x+4)$

x^2+4x

k $-3x(2-x)$

$-6x+3x^2$

l $3x(x-2)$

$3x^2-6x$

m $3x(x-2y)$

$3x^2-6xy$

n $3x(5x-2y)$

$15x^2-6xy$

o $-3x(2y-5x)$

$-6xy+15x^2$

p $-3x^2(2y-5x)$

$-6x^2y+15x^3$

q $-3y^2(2y-5x)$

$-6y^3+15xy^2$

r $-3y^2(2y-5xy)$

$-6y^3+15xy^3$

s $-3y^3(2-5x)$

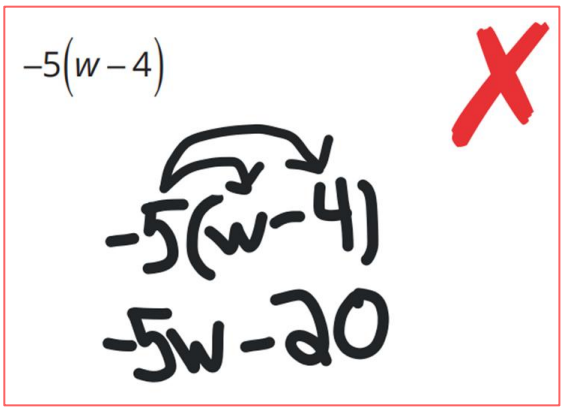
$-6y^3+15xy^3$

t $-3x(2-x)$

$-6x+3x^2$

3 Read the example carefully and answer the questions.

Destiny's work:



What did Destiny do wrong when applying the distributive property?

She didn't multiply …… and …… correctly.

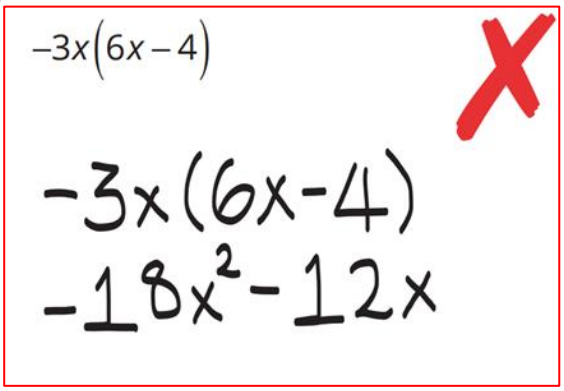
What should the correct answer be?

$-5w+20$

Expand the following: $-2(w-7)$

$-2w+14$

Hugo's work



The correct answer is $-18x^2+12x$.
What rule did Hugo forget?

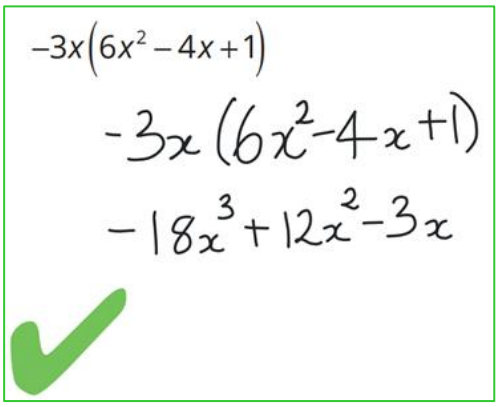
Negative times negative is ……

Expand:

$$-3x(6x^2-4x)$$

$-18x^3+12x^2$

Alicia's work



Why did Alicia write $-18x^3$ instead of $-18x^2$?

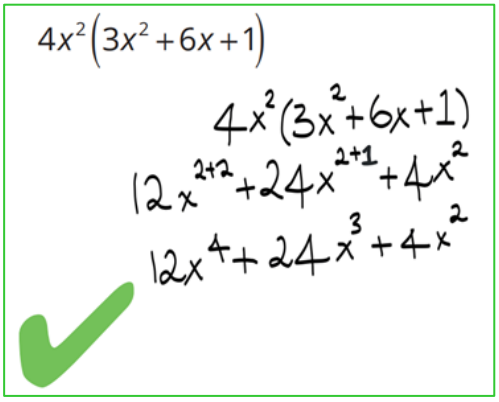
When you multiply x and x^2, you add the ……, so the answer is x^3

Expand:

$$-3x(6-4x+x^2)$$

$-18x+12x^2-3x^3$

Mora's work



Why did Mora add the exponents instead of multiplying them?

You add the exponents when …… terms with the same base.

Expand:

$$-4x^2(3x^2+6x+1)$$

$-12x^4-24x^3-4x^2$

4 Expand these expressions.

a	$2(x+3)$ $2x-6$	**b**	$2(x-7)$ $2x-14$	**c**	$-(2+x)$ $-2-x$
d	$4(7-x)$ $28-4x$	**e**	$6(2x+1)$ $12x+6$	**f**	$9(2w+3h)$ $18w+27h$
g	$-3(x+2)$ $-3x-6$	**h**	$-5(x-3)$ $-5x+15$	**i**	$-4(2-x)$ $-8+4x$
j	$-20(9+x)$ $-180-20x$	**k**	$-5(2w-3)$ $-10w+15$	**l**	$-(w+9)$ $-w-9$
m	$4(m-3n+5)$ $4m-12n+20$	**n**	$-2(p-3q-2)$ $-2p+6q+4$	**o**	$2x(x+5)$ $2x^2+10x$
p	$6a(a-4)$ $6a^2-24a$	**q**	$-4x(3x-4y)$ $-12x^2+16xy$	**r**	$3y(5y+z-8)$ $15y^2+3yz-24y$
s	$-2a(4b-7a+10)$ $-8ab+14a^2-20a$	**t**	$7y(2y-2y^2-4)$ $14y^2-14y^3-28y$	**u**	$-3a(2a^2-a-1)$ $-6a^3+3a^2+4a$

5 Decide what goes in the box to make the following true.

a	$3(\square+2)=3x+6$ x	**b**	$3(\square+2)=3x+6$ x
c	$5(k-\square)=5k-25$ 5	**d**	$k(k-\square)=k^2-7k$ 7
e	$8(t-\square)=8t-32$ 4	**f**	$-6(t-\square)=-6t+24$ 4
g	$\square(2x+5-y)=12x+30-6y$ 6	**h**	$\square(2x+5-y)=2x^2+5x-xy$ x
i	$\square(4-x-4y)=12-3x-12y$ 3	**j**	$\square(4-x-4y)=-12+3x+12y$ -3
k	$7(\square+10-\square)=7m+70-7n$ m,n	**l**	$7(\square+10-\square)=7m+70-14n$ $m,2n$
m	$5(a-\square+\square)=5a-5b+25$ $b,5$	**n**	$5(a-\square+\square)=5a-20b+25$ $4b,5$

EXPANDING THEN SIMPLIFYING

- After expanding brackets, **simplify** the result by combining **like terms**.

Example Expand then simplify the result.

$4(3p+2)-5p$ $=12p+8-5p$ $=7p+8$	How do we simplify algebraic expressions? *Simplify by combining the ..... terms*
$5(2e-3)-4(1-5e)$ $=10e-15-4+20e$ $=15e-19$	What is the coefficient of $(1-5e)$? ..... Where did the $-4+20e$ terms come from? $-4+20e$ *is the result of expanding* .....

Expand, then simplify.

a $5(3m+2)+4m$

$=15m+10+4m$

$=$ .....

$19m+10$

b $3(1-5e)+6e$

$=$ .....

$=$ .....

$3-9e$

c $4w-2(5+2w)$

$=4w-10-4w$

$=$ .....

-10

d $8-5(2x-7)$

$=$ .....

$=$ .....

$43-10x$

e $5(2a+3)+4(a+7)$

$=$ .....

$=$ .....

$14a+43$

f $3(2d+3)-5(d+4)$

$=$ .....

$=$ .....

$d-11$

Key ideas

1. After expanding, we can usually simplify the expression by combining ..... terms.

1 Expand the following and collect like terms.

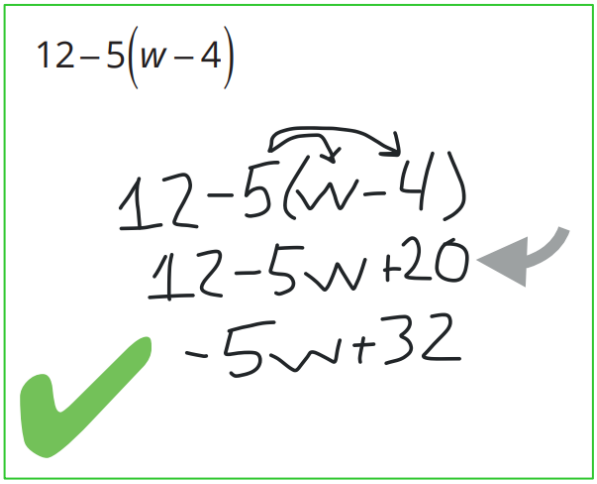
a	$3 + 2(x + 4)$	**b**	$2 + 5(3x - 1)$	**c**	$3 + 4(x - 2)$
	$11 + 2x$		$-3 + 15x$		$-5 + 4x$
d	$3 - 4(x - 2)$	**e**	$1 - 5(x + 4)$	**f**	$5 - (x - 6)$
	$11 - 4x$		$-19 - 5x$		$11 - x$
g	$9 - (x - 3)$	**h**	$5 - (3 + 2x)$	**i**	$7 + 2(x - 3)$
	$12 - x$		$2 - 2x$		$1 + 2x$

2 Expand then simplify.

a	$3(x - 4) + 1$		**l**	$-3(x - 4) + 1$	
		$3x - 11$			$-3x + 13$
b	$3(x - 4) - 2$		**m**	$-3(x - 4) - 2$	
		$3x - 14$			$-3x + 10$
c	$3(x - 4) - x$		**n**	$-3(x - 4) - x$	
		$2x - 12$			$-4x + 12$
d	$3(x - 4) - 3x$		**o**	$-3(x - 4) - 3x$	
		-12			$-6x + 12$
e	$2 + 3(x - 4)$		**p**	$2 - 3(x - 4)$	
		$3x - 10$			$-3x + 14$
f	$-3 + 3(x - 4)$		**q**	$-3 - 3(x - 4)$	
		$3x - 15$			$-3x + 9$
g	$x + 3(x - 4)$		**r**	$x - 3(x - 4)$	
		$4x - 12$			$-2x + 12$
h	$-2x + 3(x - 4)$		**s**	$-2x - 3(x - 4)$	
		$x - 12$			$-5x + 12$
i	$3x(x - 4) + 2x$		**t**	$-3x(x - 4) + 2x$	
		$3x^2 - 10x$			$-3x^2 + 14x$
j	$2x + 3x(x - 4)$		**u**	$2x - 3x(x - 4)$	
		$3x^2 - 10x$			$-3x^2 + 14x$
k	$-2x + 3x(x - 4)$		**v**	$-2x - 3x(x - 4)$	
		$3x^2 - 14x$			$-3x^2 + 10x$

3 Read the example carefully and answer the questions.

John's work:



Where did the +20 come from in the step marked with an arrow?

…… × …… = 20

Would he have gotten the same answer if he first subtracted 5 from 12? Explain.

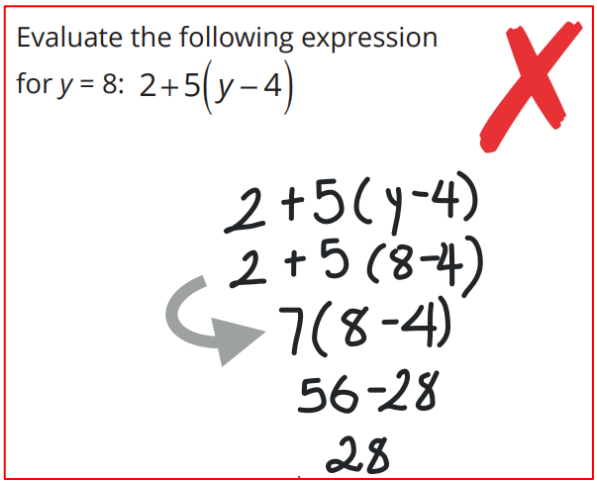
……, you would get 7w, which is incorrect as it doesn't follow the …… of ……

Expand and simplify

$$12 + 5(w - 4)$$

$5w - 8$

Louis' work



What did Louis do in the step marked with an arrow?

Added …… and ……

What should he have done instead?

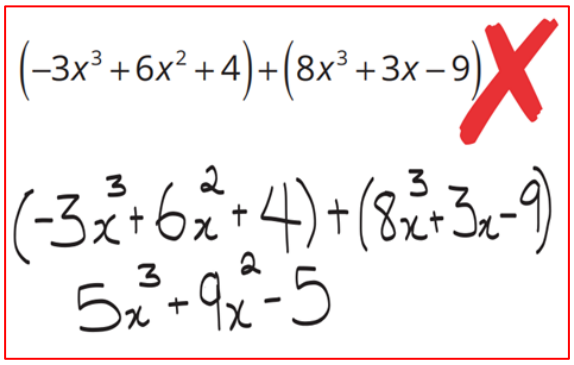
…… 4 from 8, or …… the brackets.

Evaluate the following expression for $y = 8$:

$$2y + 5(y - 4)$$

36

Eric's work



Eric made a mistake when adding the terms. What did he add incorrectly?

He added …… and ……, which are not …… terms.

Simplify:

$$(-3x^3 + 6x^2 + 4x) + (8x^3 - 3x + 9)$$

$5x^3 + 6x^2 + x + 9$

4 Expand and simplify.

a $3(x+2)+2(x+3)$

$5x+12$

b $3(x+2)+2(x-3)$

$5x$

c $3(x+2)-2(x+3)$

x

d $3(x+2)-2(x-3)$

$x+12$

e $p(p+2)+5(p+3)$

$p^2+7p+15$

f $p(p-3)+p(p+3)$

$2p^2$

g $p(3-2p)-3p(p-2)$

$-5p^2+9p$

5 Expand the following and collect like terms.

a $2(x+3)+3(x+2)$

$5x+12$

b $3(2x+1)+5(x-1)$

$11x-2$

c $4(3x+2)+5(x-3)$

$17x-7$

d $-2(x+2)+3(x-1)$

$x-7$

e $2(4x-3)-2(3x-1)$

$2x-4$

f $-(x+3)-3(x+5)$

$-4x-18$

g $-2(2x-4)-3(3x+5)$

$-13x-7$

h $3(3x-1)-2(2-x)$

$11x-7$

i $-4(5-x)-(2x-5)$

$2x-15$

6 Expand and simplify these expressions.

a $2x(x+1)+3x(x+4)$

$5x^2+14x$

b $3x(x+4)+2x(x+1)$

$5x^2+14x$

c $3x(x+1)+2x(x+4)$

$5x^2+11x$

d $3x(x-1)+2x(x+4)$

$5x^2+5x$

e $3x(x+1)+2x(x-4)$

$5x^2-5x$

f $3x(x-1)+2x(x-4)$

$5x^2-11x$

g $3x(x-1)-2x(x-4)$

x^2+5x

h $3x(x+1)-2x(x+4)$

x^2-5x

i $3x(x+1)-2(x+4)$

$3x^2+x-8$

j $3x(x+1)-5(x+4)$

$3x^2-2x-20$

k $3x^2(x+1)-5x(x+4)$

$3x^3-2x^2-20x$

l $3x^2(x-1)-5x(x-4)$

$3x^2-8x^2+20x$

m $3x^2(x-1)-(5x^2-4)$

$3x^3-8x^2+4$

n $3x^2(x-1)-5x^2$

$3x^3-8x^2$

o $5x^2-3x^2(x-1)$

$8x^2-3x^3$

p $5-3x^2(x-1)$

$5-3x^3+3x^2$

q $5+3x^2(1-x)$

$5+3x^2-3x^3$

r $5+3x^2(y-x)$

$5+3x^2y-3x^3$

7 Find the missing number to make these equations true.

a $4(k + \square) + 3(k - 5) = 7k - 3$

3

b $3(2 - r) + \square(6 - 2r) = r - 6$

-2

c $2(d - 5) - \square(1 - d) = 7d - 15$

5

8 Expand and simplify these expressions.

a $4x(3x + y) + 2x(5x - 2y)$

$22x^2$

b $5m(4m - 3n) - 2m(9m - 2n)$

$2m^2 - 11mn$

c $3a^2(4a^3 - b^4) + 2a^2(5a^3 + 3b^4)$

$22a^5 + 3a^2b^4$

d $2y^3(5y^2 + 3y^4) - 4y^2(2y^2 - y^4)$

$10y^5 + 6y^7 - 8y^4 + 4y^6$

e $5a^2b(2a^3b^2 - 3ab^3) - 4a^2b(3a^3b^2 - 4ab^3)$

$-2a^5b^3 + a^3b^4$

9 Find the missing expressions to make these equations true.

a $7(p - 3) - 4(\square) = 3p - 1$

$p - 5$

b $3(5p + 9) - 4(\square) = 3p - 1$

$3p + 7$

c $8(3p + 1) - 3(\square) = 3p - 1$

$7p + 3$

d $3(5p - 3) - 4(\square) = 3p - 1$

$3p - 2$

e $11(3p - 5) - 6(\square) = 3p - 1$

$5p - 9$

10 Identify the mistake in these expansions, then write out the correct expansion.

a $2(x+6) = 2x+6$

Mistake:

Didn't multiply 2 and 6

Correct answer:

$2x+12$

b $x(x-4) = 2x-4x$

Mistake:

$x \times x = x^2$

Correct answer:

x^2-4x

c $-3(x+4) = -3x+12$

Mistake:

$-3 \times -4 = 12$

Correct answer:

$-3x-12$

d $-7(x-7) = -7x-49$

Mistake:

$-7 \times -7 = +49$

Correct answer:

$-7x+49$

e $5-2(x-7) = 5-2x-14$
$= -9-2x$

Mistake:

$-2 \times -7 = +14$

Correct answer:

$19-2x$

f $4(x-2)-3(x+2) = 4x-8-3x+6$
$= x-2$

Mistake:

$-3 \times 2 = -6$

Correct answer:

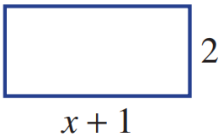
$x-14$

11 $5(2x+1)+c(x+d) = 12x-1$
What is the value of c and d?

$c = 2, d = -3$

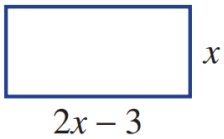
12 Find the area of these basic shapes in expanded form.

a



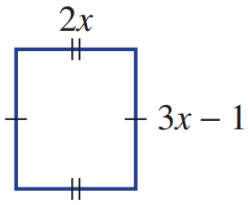
$2x + 2$

b



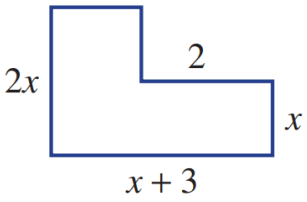
$2x^2 - 3x$

c



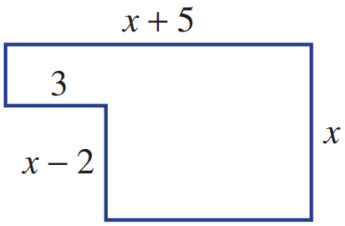
$6x^2 - 2x$

d



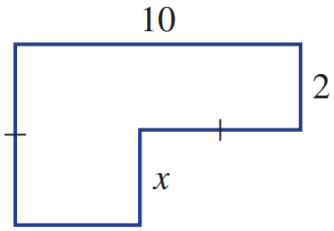
$2x^2 + 4x$

e



$6 + x^2 + 2x$

f



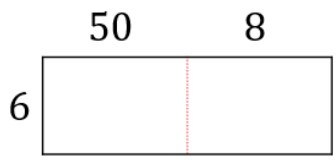
$20 + 8x - x^2$

EXPANDING BINOMIAL PRODUCTS

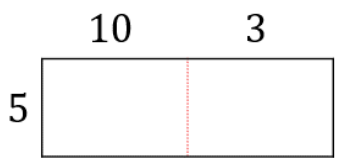
Investigation Expanding binomial products.

Calculate the following using the area model. (do not use the algorithm!)

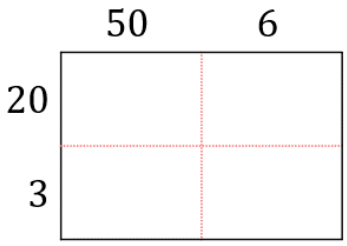
a $6 \times 58 = 6(50 + 8)$



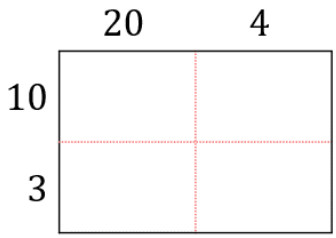
b $5 \times 13 = 5(10 + 3)$



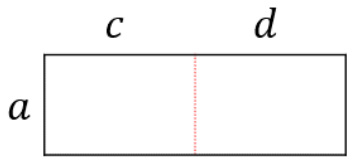
c $23 \times 56 = (20 + 3)(50 + 6)$



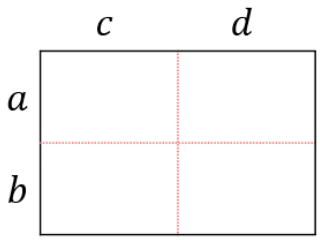
d $13 \times 24 = (10 + 3)(20 + 4)$



e $a(c + d)$



f $(a + b)(c + d)$



BINOMIAL PRODUCTS

- A **binomial** has two terms in its simplest form: $a + b$
- When you **multiply** two binomial expressions, this is called a **binomial product**.
- We can expand binomial products using the area model.

Area Model for Binomial Products

$(a + b)(c + d)$

$= a(c + d) + b(c + d)$

$= ac + ad + bc + bd$

	c	d
a	ac	ad
b	bc	bd

Example Expand binomial products.

$(p + 3)(q - 4)$

$= p(q - 4) + 3(q - 4)$

$= pq - 4p + 3q - 12$

	q	-4
p	pq	$-4p$
3	$3q$	-12

$(3x - 5)(x + 4)$

$= 3x(x + 4) - 5(x + 4)$

$= 3x^2 + 12x - 5x - 20$

$= 3x^2 + 7x - 20$

	$3x$	-5
x	$3x^2$	$-5x$
4	$12x$	-20

How do you know when an expression is not fully simplified?

An expression is not fully simplified when there are ....

Expand and simplify these expressions.

a $(p + 4)(q + 6)$

$= p(q + 6) + 4(q + 6)$

$= \dots\dots\dots\dots\dots\dots\dots\dots$

	p	4
q		
6		

$pq + 4q + 6p + 24$

b $(x - 2)(x + 6)$

$= x(\qquad) - 2(\qquad)$

$= \dots\dots\dots\dots\dots\dots\dots\dots$

$= \dots\dots\dots\dots\dots\dots\dots\dots$

	x	6
x		
-2		

$x^2 + 4x - 12$

c $(2a - b)(3a + 2)$

$= \dots\dots\dots\dots\dots\dots\dots\dots$

$= \dots\dots\dots\dots\dots\dots\dots\dots$

	$3a$	2
$2a$		
$-b$		

$6a^2 + 4a - 3ab - 2b$

d $(4x + 3)(2x + 5)$

$= \dots\dots\dots\dots\dots\dots\dots\dots$

$= \dots\dots\dots\dots\dots\dots\dots\dots$

$= \dots\dots\dots\dots\dots\dots\dots\dots$

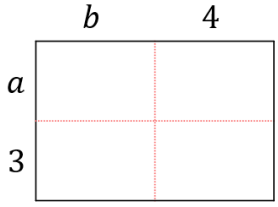
$8x^2 + 26x + 15$

Key ideas

1. Binomial means ..... terms.
2. A binomial product means to multiply ..... binomials.

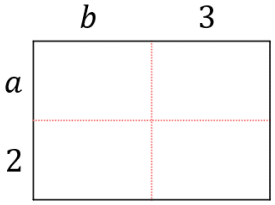
1 Expand these expressions. Use the area model to help you.

a $(a+3)(b+4)$



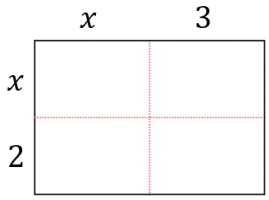
$ab + 4a + 3b + 12$

b $(a+2)(b+3)$



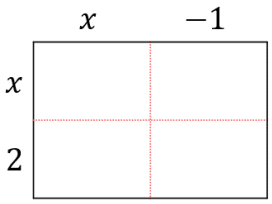
$ab + 3a + 2b + 6$

c $(x+2)(x+3)$



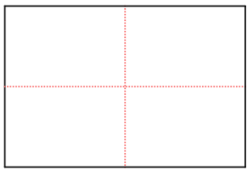
$x^2 + 5x + 6$

d $(x+2)(x-1)$



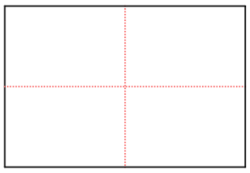
$x^2 + x - 2$

e $(2x+3)(x+1)$



$2x^2 + 5x + 3$

f $(x-2)(2x+5)$



$2x^2 + x - 10$

2 Expand these expressions without an area model.

a $(x+1)(x+5)$

$= x(x+5) + 1(x+5)$

$= \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$

$= \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$

$x^2 + 6x + 5$

b $(x-3)(x+2)$

$= x(\qquad) - 3(\qquad)$

$= \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$

$= \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$

$x^2 - x - 6$

c $(3x-2)(7x+2)$

$= 3x(\qquad) - 2(\qquad)$

$= \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$

$= \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$

$21x^2 - 8x - 4$

d $(4x-1)(3x-4)$

$12x^2 - 19x + 4$

e $(x-2)(4-x)$

$-x^2 + 6x - 8$

f $(2x-5)(4-3x)$

$-6x^2 + 23x - 20$

EXPANDING BINOMIAL PRODUCTS USING THE RULE

- To expand a binomial product:
  1. Multiply each term in the first bracket by each term in the second bracket.
  2. Simplify the result.

Distributive Law for Binomial Products
$(a+b)(c+d) = ac + ad + bc + bd$

Example Expand binomial products.

$(x+3)(x+5)$	$(x-4)(x+7)$
$(x+3)(x+5) = x^2 + 5x + 3x + 15$	$(x-4)(x+7) = x^2 + 7x - 4x - 28$
$= x^2 + 8x + 15$	$= x^2 + 3x - 28$

Expand and simplify these expressions.

a $(x+4)(x+2)$

$=$ .....

$=$ .....

$x^2 + 6x + 8$

b $(x-5)(x-2)$

$=$ .....

$=$ .....

$x^2 - 7x + 10$

c $(2x-1)(x-6)$

$=$ .....

$=$ .....

$2x^2 - 13x + 6$

d $(5x-2)(3x+7)$

$=$ .....

$=$ .....

$15x^2 + 29x - 14$

Key ideas

1. We can multiply binomials using the rule:

   $(a+b)(x+y) = a(\qquad) + b(\qquad)$

   $=$ .....

1 Expand and simplify these expressions.

a $(x+5)(x+3)$

$x^2+8x+15$

b $(x+3)(x+5)$

$x^2+8x+15$

c $(x-3)(x+5)$

$x^2-2x-15$

d $(x+3)(x-5)$

$x^2-2x-15$

e $(x-3)(x-5)$

$x^2-8x+15$

f $(x-3)(x-3)$

x^2-6x+9

g $(x-3)^2$

x^2-6x+9

h $(x+3)^2$

x^2+6x+9

i $(x+6)^2$

$x^2+12x+36$

j $(x+6)(x-6)$

x^2-36

k $(x+5)(x-5)$

x^2-25

l $(x+5)(5-x)$

$-x^2+25$

m $(3x-1)(4x+4)$

$12x^2+8x-4$

n $(3x-1)(4x-4)$

$12x^2-16x+4$

o $(3x+2)(3x-2)$

$9x^2-4$

p $(3x-2)(3x-2)$

$9x^2-12x+4$

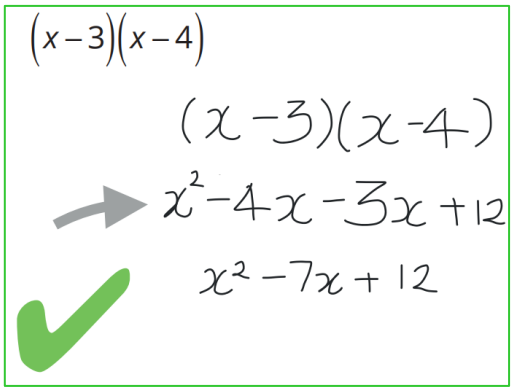
q $(ax-b)(cx-d)$

$acx^2-adx-bcx+bd$

r $(ax+b)(cx+d)$

$acx^2+adx+bcx+bd$

2 Read the example carefully and answer the questions.



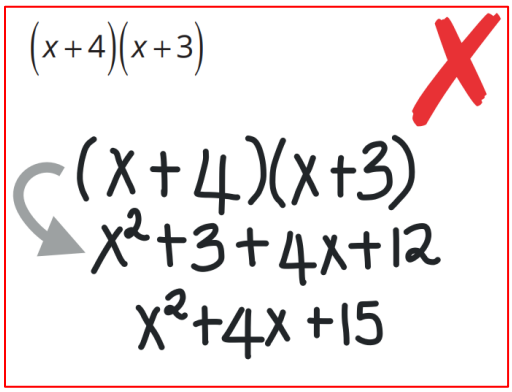
In the step marked with an arrow, where did the + sign come from?

..... × ..... = +12

Expand

$(x-3)(x-6)$

$x^2-9x+18$



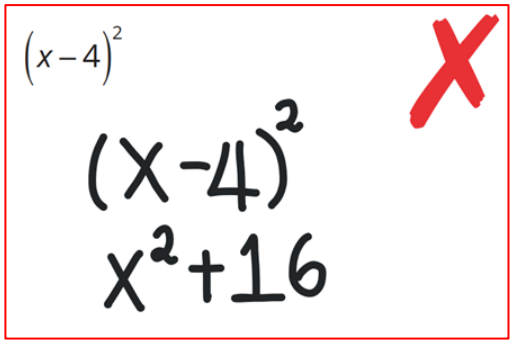
In the step marked with an arrow, what mistake did this student make?

The 3 should be ..... instead.

Expand

$(x+4)(x-3)$

x^2+x-12



What is another way that to write $(x-4)^2$?

$(x-4)^2 = (\quad)(\quad)$

Expand

$(x-4)^2$

$x^2+8x+16$

3

a Solve $2x+8=10$

$x=1$

b Factorise $2x+8$

$2(x+4)$

c Evaluate $2x+8$ if $x=3$

14

d Expand and simplify $(2x+8)^2$

$4x^2+32x+64$

CHECK YOUR UNDERSTANDING

Expanding negative coefficients

1	Expand $5(2a-4)$							
	a	$10a-20$	**b**	$7a-4$	**c**	$10a-4$	**d**	$-10a$
2	Expand $2x(5x-1)$							
	a	$8x^2$	**b**	$7x^2-2x$	**c**	$8x$	**d**	$10x^2-2x$
3	Expand $-3(m+2)$							
	a	$3m+6$	**b**	$-3m-6$	**c**	$3m-6$	**d**	$-3m+6$
4	Tom says $-6(2-3p)=-12+18p$ Katie says $-6(2-3p)=-12-18p$ Who is correct?							
	a	Only Tom	**b**	Only Katie	**c**	Both	**d**	Neither
5	Tom says $-3(1-2p)=-3+6p$ Katie says $-3(1-2p)=6p-3$ Who is correct?							
	a	Only Tom	**b**	Only Katie	**c**	Both	**d**	Neither
6	Expand $-5(m-7)$							
	a	$5m+35$	**b**	$-5m-35$	**c**	$-5m+35$	**d**	$5m-35$
7	Expand $-4y(2-x)$							
	a	$-6y+4xy$	**b**	$-4y+2+x$	**c**	$-4y+2-x$	**d**	$-8y-4xy$
8	Expand $-(1-2p)$							
	a	$-1+2p$	**b**	$-1-2p$	**c**	$1+2p$	**d**	$1-2p$

Expanding then simplifying

1	Expand and simplify $7 + 4(3x + 2)$							
	a	$7c + 6$	**b**	$12c + 8$	**c**	$12c + 15$	**d**	$12c + 2$
2	Expand and simplify $2a - 4(3 - a)$							
	a	$-2a - 12$	**b**	$6a - 12$	**c**	$-6a$	**d**	$a - 12$
3	Expand and simplify $5a - (3 - a)$							
	a	$6a - 3$	**b**	$4a - 3$	**c**	$4a + 3$	**d**	$3a$
4	Expand and simplify $3(4x - 2) + 2(x + 5)$							
	a	$14x + 4$	**b**	$14x + 3$	**c**	$14x - 4$	**d**	$14x - 14$
5	Expand and simplify $5(y + 5) + 3(2 + y)$							
	a	$31y$	**b**	$8y^2 + 31y$	**c**	$8y + 31$	**d**	None of these
6	Expand and simplify $4(2x + 1) - (5x - 9)$							
	a	$3x - 5$	**b**	$3x + 13$	**c**	$13x - 5$	**d**	$13x + 13$
7	Expand and simplify $2(5 - x) - 3(x - 6)$							
	a	$x - 8$	**b**	$28 - 5x$	**c**	$-5x - 8$	**d**	$28 - x$

Expanding binomial products

1 Identify the product of these two terms.

$(x + 5)(x - 3)$

a x **b** x^2 **c** $2x$ **d** $x2$

2 Identify the product of these two terms.

$(x + 5)(x - 3)$

a $x + 3$ **b** $3x$ **c** $x - 3$ **d** $-3x$

3 Identify the product of these two terms.

$(x + 5)(x - 3)$

a $5x$ **b** $x + 5$ **c** $x - 5$ **d** $-5x$

4 Identify the product of these two terms.

$(x + 5)(x - 3)$

a 2 **b** -15 **c** -8 **d** 15

5 Expand $(x + 4)(x - 1)$

a $x^2 - x + 4x + 3$ **b** $x^2 + x + 4x - 3$ **c** $x^2 - x - 4x + 4$ **d** $x^2 - x + 4x - 4$

6 Expand $(x + 5)(x + 9)$

a $x^2 + 45$ **b** $x^2 + 14x + 45$ **c** $60x^2$ **d** $x^2 + 59x$

7 Expand $(3x - 2)(x + 1)$

a $3x^2 - x - 2$ **B** $3x^2 - x + 2$ **c** $3x^2 + x - 2$ **d** $3x^2 + x + 2$

8 Expand $(x - 2)(1 - x)$

a $-x^2 + 3x - 2$ **B** $x^2 - 3x + 2$ **c** $-x^2 - 3x + 2$ **d** $-x^2 - x - 2$